Total Technology Practice: Preliminary study for application in New Zealand schools

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ABSTRACT

The purpose of this research was to identify the important generic elements of total technology practice and to develop a preliminary list of the important techniques, knowledge and actions used by technologists. The research was based on the hypothesis that in technology education in New Zealand schools, the important elements of technology practice could be represented in the form of a model that could be used to organise and communicate the elements and knowledge involved in total technology practice.

The research was undertaken with technologists working at Massey University and teachers involved in teaching technology. A product development research methodology was used to test ideas and develop a model of technology practice for use in New Zealand schools. The first phase of the research used the experience and knowledge of product development technologists to identify the important elements of technology practice and develop preliminary lists of techniques and knowledge involved in each element. A group of specialist technologists were used to verify these elements and identify detailed content.

This research showed that total technology practice can be structured using seven elements that together provide a simplified description of total technology practice. The elements of practice associated with the human context and goal of technology practice were identified as society, the work environment, and purposeful action. The elements technologists bring to the context were organisation, information, resource use, and an extensive knowledge of techniques and the skill, ingenuity and experience to apply and adapt techniques to specific contexts and problems.

Individual technologists were interviewed to identify the important practices and knowledge within their area of expertise. Technological knowledge was structured into a framework that reflected the way technologists broke complex systems into subsystems to solve problems and develop solutions.

The detailed model developed with the technologists was evaluated by groups of teachers using focus group techniques and a small survey. The study indicated teachers perceived the model as a useful tool for communicating knowledge and understanding of technology practice and for structuring teaching units in technology education.

This preliminary study indicated technology practice can be described in terms of seven elements and communicated in the form of a model. Technologists organise their knowledge into structures that facilitate application in practice. This structure and much of its knowledge can be made explicit and used to help students understand technological products and develop capability in their technology practice.

This study has identified a structure for technology practice and technological knowledge that is common to all seven technological areas and nine contexts identified in the New Zealand technology curriculum.

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